EDS-510E Series

7+3G-port Gigabit managed Ethernet switches

- 3 Gigabit Ethernet ports for redundant ring or uplink solutions
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- RADIUS, TACACS+, SNMPv3, IEEE 802.1x, HTTPS, and SSH to enhance network security
- EtherNet/IP, PROFINET, and Modbus/TCP protocols supported for device management and monitoring
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

Introduction

The EDS-510E Gigabit managed Ethernet switch is designed to meet rigorous mission critical applications, such as factory automation, ITS and process control. The 3 Gigabit Ethernet ports allows great flexibility to build up a Gigabit redundant Turbo Ring and a Gigabit uplink. The switch adopts USB interfaces for switch configuration, system file backup, and firmware upgrade, making it easier to manage.

Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- RADIUS, TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Automatic warning by exception through e-mail, relay output
- Configurable by web browser, Telnet/USB console, CLI, MXconfig, and ABC-02 automatic backup configurator

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D-2004 for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Software Features

Management: IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, Telnet, Syslog, SNMP Inform, Flow Control, Back Pressure Flow Control
Filter: 802.1Q VLAN, Port-Based VLAN, GVRP, IGMP v1/v2/v3, GMRP
Redundancy Protocols: STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
Security: RADIUS, TACACS+, SSL, SSH, Broadcast Storm Protection, Port Lock
Time Management: SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)
Industrial Protocols: EtherNet/IP, Modbus/TCP, PROFINET IO
MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

Switch Properties

Priority Queues: 4
Max. Number of VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit

Interface

RJ45 Ports: 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot
Console Port: USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
DIP Switches: Turbo Ring, Master, Coupler, Reserve

Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics.
• +13 to +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA
Button: Reset button

Power Requirements

Input Voltage: 12/24/48/-48 VDC, redundant dual inputs
Operating Voltage: 9.6 to 60 VDC
Input Current: 0.58 A @ 24 V
Overload Current Protection: Present
Connection: 2 removable 4-contact terminal blocks
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal
IP Rating: IP30 protection
Dimensions: 79.2 x 135 x 116 mm (3.12 x 5.31 x 4.57 in)
Weight: 1690 g (3.73 lb)
Installation: DIN-rail mounting, wall mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: UL 508
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
EMC: EN 61000-6-2/6-4
EMI: CISPR 22, FCC Part 15B Class A
EMS:
IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV
IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV
IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV
IEC 61000-4-6 CS: Signal: 10 V
IEC 61000-4-8
Electrical Substations: IEC 61850-3, IEEE 1613
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4
Marine: DNV, GL, LR, ABS, NK
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

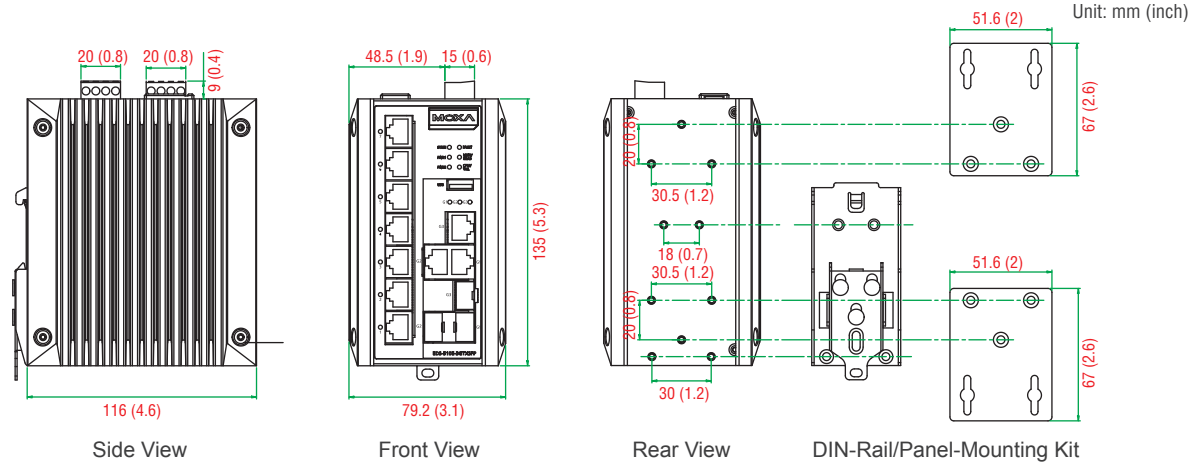
Time: 723,532 hours
Standard: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Side View | Front View | Rear View | DIN-Rail/Panel-Mounting Kit

Ordering Information

Available Models		Port Interface	
		Gigabit Ethernet	Fast Ethernet
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X) or 100/1000BaseSFP*	10/100BaseT(X)
EDS-510E-3GTXSFP	EDS-510E-3GTXSFP-T	3	7

*The EDS-510E series supports up to 3 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit / Fast Ethernet SFP module product information.

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes
EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02-USB: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature
DR-4524/75-24/120-24: 45/75/120 W DIN-rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
RK-4U: 4U-high 19-inch rack-mounting kit

Package Checklist

- EDS-510E switch
- USB Cable: CBL-USBA/B-100
- Protective caps for unused ports
- Documentation and software CD
- Warranty card
- Hardware installation guide (printed)

SFP-1G Series

1-port Gigabit Ethernet SFP modules

- Digital Diagnostic Monitor Function
- -40 to 85°C operating temperature range (T models)
- IEEE 802.3z compliant
- Differential LVPECL inputs and outputs
- TTL signal detect indicator
- Hot pluggable LC duplex connector
- Class 1 laser product, complies with EN 60825-1

Specifications

Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)

Optical Fiber

		Gigabit Ethernet SFP								
		SFP-SX		SFP-LSX		SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120
Transceiver Type		Multi-Mode		Multi-Mode		Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode
Fiber Cable Type		OM1	OM2	OM2	OM1	G.652	G.652	G.652	G.652	G.652	G.652
Typical Distance		300 m	550 m	1 km	2 km	10 km	30 km	40 km	80 km	110 km	120 km
Wave-length	Typical (nm)	850		1310		1310	1310	1310	1550	1550	1550
	TX Range (nm)	830 to 860		1270 to 1355		1280 to 1355	1280 to 1355	1280 to 1340	1530 to 1570	1530 to 1570	1530 to 1570
	RX Range (nm)	770 to 860		1260 to 1610		1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1100 to 1600
Optical Power	TX Range (dBm)	-4 to -9.5		-1 to -9		-3 to -9	-3 to -8	+3 to -4	+5 to 0	+5 to 0	+3 to -2
	RX Range (dBm)	0 to -18		-1 to -19		-3 to -21	-3 to -23	-1 to -24	-1 to -24	-9 to -30	-8 to -33
	Link Budget (dB)	8.5		10		12	15	20	24	30	31
	Dispersion Penalty (dB)	4.3	3.6	5	5	1	1	1	1	1	2

Note: When connecting the SFP-LHX, ZX, EZX, or EZX-120, we recommened using an attenuator to prevent the transceiver from being damaged by excessive optical power.

		WDM Gigabit Ethernet SFP					
		SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Transceiver Type		Single-Mode		Single-Mode		Single-Mode	
Fiber Cable Type		G.652		G.652		G.652	
Typical Distance		10 km		20 km		40 km	
Wave-length	Typical (nm)	TX 1310, RX 1550	TX 1550, RX 1310	TX 1310, RX 1550	TX 1550, RX 1310	TX 1310, RX 1550	TX 1550, RX 1310
	TX Range (nm)	1270 to 1355	1530 to 1570	1270 to 1355	1530 to 1570	1290 to 1330	1530 to 1570
	RX Range (nm)	1480 to 1580	1260 to 1360	1480 to 1580	1260 to 1360	1480 to 1580	1260 to 1360
Optical Power	TX Range (dBm)	-3 to -9		-2 to -8		+2 to -3	
	RX Range (dBm)	-3 to -21		-2 to -23		-1 to -23	
	Link Budget (dB)	12		15		20	
	Dispersion Penalty (dB)	2		3		1	

Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1G10ALC and SFP-1G10BLC)
Note: When connecting the SFP-40A and 40B, we recommend using an attenuator to prevent damage caused by excessive optical power.

Typical Distance: To reach the typical distance of specified fiber transceiver, please refer to formula: Link budget(dB) > dispersion penalty(dB) + total link loss(dB).

Power Requirements

Power Consumption: Max. 1 W

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

Safety: CE, FCC, TÜV (EN 60825), UL 60950-1
Marine: DNV, GL

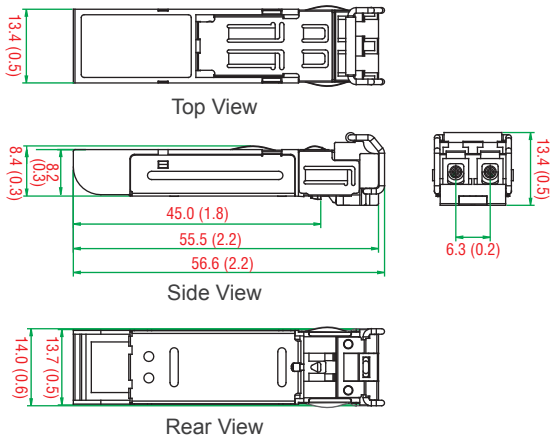
Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

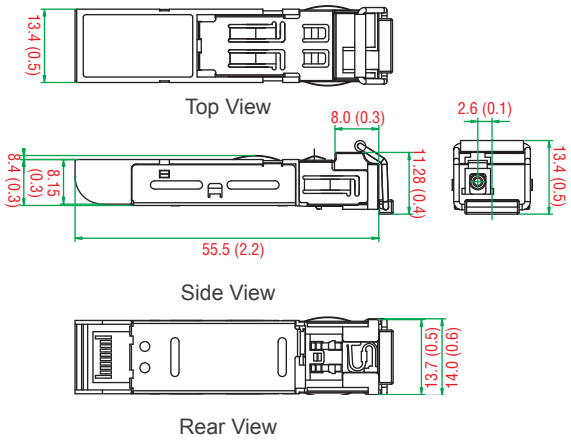
Dimensions

Unit: mm (inch)

SFP-1G Series



SFP-1G Series (WDM Type)



Ordering Information

Gigabit Ethernet SFP Models				WDM Gigabit Ethernet SFP Models			
Standard Temperature Models (0 to 60°C)	Wide Temperature Models (-40 to 85°C)	Transeiver Type	Typical Distance	Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	Transeiver Type	Typical Distance
SFP-1GSXLC	SFP-1GSXLC-T*	Multi-Mode	300/550 m	SFP-1G10ALC	SFP-1G10ALC-T	Single-Mode	10 km
SFP-1GLSXLC	SFP-1GLSXLC-T	Multi-Mode	1/2 km	SFP-1G10BLC	SFP-1G10BLC-T	Single-Mode	10 km
SFP-1GLXLC	SFP-1GLXLC-T	Single-Mode	10 km	SFP-1G20ALC	SFP-1G20ALC-T	Single-Mode	20 km
SFP-1GLHLC	SFP-1GLHLC-T	Single-Mode	30 km	SFP-1G20BLC	SFP-1G20BLC-T	Single-Mode	20 km
SFP-1GLHXLC	SFP-1GLHXLC-T	Single-Mode	40 km	SFP-1G40ALC	SFP-1G40ALC-T	Single-Mode	40 km
SFP-1GZXLC	SFP-1GZXLC-T	Single-Mode	80 km	SFP-1G40BLC	SFP-1G40BLC-T	Single-Mode	40 km
SFP-1GEZXLC	–	Single-Mode	110 km	–	–	–	–
SFP-1GEZXLC-120	–	Single-Mode	120 km	–	–	–	–

*SFP-1GSXLC-T: -20 to 75°C operating temperature

Package Checklist

- SFP-1G module
- Warranty card

SFP-1FE Series

1-port Fast Ethernet SFP modules

- Digital Diagnostic Monitor Function
- IEEE 802.3u compliant
- Differential PECL inputs and outputs
- TTL signal detect indicator
- Hot pluggable LC duplex connector
- Class 1 laser product; complies with EN 60825-1

Specifications

Interface

Ethernet Ports: 1
Connectors: Duplex LC Connector

Optical Fiber

		Fast Ethernet SFP			
		SFP-M		SFP-S	SFP-L
Transceiver Type		Multi-Mode		Single-Mode	
Fiber Cable Type		OM1/OM2	62.5/125, 50/125 µm 800 MHz*km	G.652	G.652
Typical Distance		2 km	4 km	40 km	80 km
Wave-length	Typical (nm)	1310		1310	1550
	TX Range (nm)	1280 to 1340		1280 to 1340	1530 to 1570
	RX Range (nm)	1100 to 1650		1100 to 1600	1100 to 1600
Optical Power	TX Range (dBm)	-8 to -18		0 to -5	0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34	-3 to -34
	Link Budget (dB)	14		29	29
	Dispersion Penalty (dB)	2	3	1	1

Note: When connecting the SFP-S or L, we recommend using an attenuator to prevent damage caused by excessive optical power.

Power Requirements

Power Consumption: Max. 1 W

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications

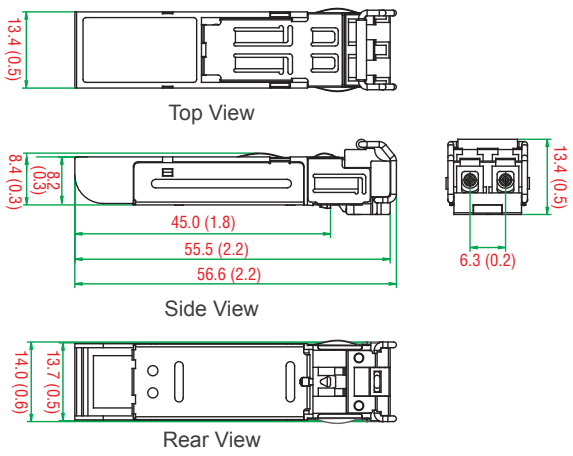
Safety: CE, FCC, TÜV, UL 60950-1
Marine: DNV, GL

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Available Models	Port Interface		
Wide Temperature (-40 to 85°C)	100BaseFX, Multi-Mode, LC Connector, 4 km	100BaseFX, Single-Mode, LC Connector, 40 km	100BaseFX, Single-Mode, LC Connector, 80 km
SFP-1FEMLC-T	1	–	–
SFP-1FESLC-T	–	1	–
SFP-1FELLC-T	–	–	1

Package Checklist

- SFP-1FE module
- Warranty card